Claims:

Amend all of the claims 1-28 as follows:

Claim 1 (currently amended): A multiuser ~~DSSS-OFDM~~ direct sequence spread spectrum (DSSS) orthogonal frequency division multiplexing (OFDM) multiband of ~~UWB~~ ultra wideband (UWB) ~~base station~~ communication ~~transmitter~~ system comprising:

~~a multiuser encoding and spreading unit;~~

~~a polyphase-based multiband;~~

~~a IFFT unit;~~

~~a filtering unit, and~~

~~a multiband-based modulation and multicarrier.~~

N UWB mobile stations, where N is an integer;

an UWB basestation coupled to an UWB network interface that is connected to an UWB network; and

said UWB basestation further including M convolution encoders, M interleavers, M multiplers; M user keys; a summation, a multiband splitter, M serial-to-parallel (S/P) converters, M inverse fast Fourier transform (IFFT), M guards, M filtering units, a multiband multicarrier modulation, and a power amplifier (PA), where M is an integer.

Claim 2 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base station~~ communication ~~transmitter~~ system of claim 1 wherein said ~~multiuser encoding and spreading unit includes an N-user bitstream, a N-convolution encoder, a N-interleaver, a N-spread multiplier, and a N-user key sequence.~~ each of the M user keys is a unique pseudorandom (PN) sequence.

Claim 3 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 2 wherein said ~~N-user key sequence is~~ M user keys are orthogonal each other.

Claim 4 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 3 wherein a cross-correlation between one user key ~~sequence~~ and other user keys ~~sequences~~ is almost equal to zero value.

Claim 5 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 1 wherein said ~~polyphase-based~~ multiband splitter further includes ten sample delay[[s]] units, eleven down sample[[s]] units, eleven random access memory (RAM) ~~memories~~ units, and one modular counter.

Claim 6 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 5 wherein said ~~polyphase-based~~ multiband splitter converts an N length of a serial sequence into eleven multiband sequences with a length of N/11[[.]], where N is equal to 11P and P is an integer.

Claim 7 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 1 wherein said M IFFT ~~unit includes~~ contain eleven IFFTs in parallel, each of the IFFTs having 24 Nulls and 512 complex inputs to produce 1024 real-value outputs.

Claim 8 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 1 wherein said M filtering ~~unit~~ sections includes eleven filtering ~~sections~~ systems, each of the filtering ~~section~~ systems having a dual-switch, two transmitter shaped filters, two digital-to-analog (D/A) converters, two analog reconstruction filters, and one bit detector.

Claim 9 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 8 wherein said dual-switch contains two switches, one switch [[of]] rotating at even number of input positions and another switch [[of]] rotating at odd number of input positions sequentially.

Claim 10 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 8 wherein said bit detector is used to ~~identifies~~ identify ~~a value of~~ the dual-switch output values.

Claim 11 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base-station~~ communication ~~transmitter~~ system of claim 1 wherein said multiband~~-based~~ multicarrier modulation ~~and multicarrier~~ includes eleven multiband quadrature phase-shift keying (QPSK) modulations, which are controlled by eleven bit detectors, coupled to one summation[[,]] [[and]] followed by one analog bandpass filter.

Claim 12 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base station~~ communication ~~transmitter~~ system of claim 11 wherein said each of eleven multiband QPSK modulations ~~and multicarrier~~ further includes a multi-oscillator, two oscillator switches and one QPSK switch both controlled by the bit detector, ~~and one up-carrier multiplier and one down-carrier multiplier.~~ an even-sequence-based mixer and an odd-sequence-based mixer.

Claim 13 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base station~~ communication ~~transmitter~~ system of claim 12 wherein said multi-oscillator contains ~~four carriers of~~ positive and negative carrier $\sin(2\pi f_i t)$ [[,]] and positive and negative carrier $\cos(2\pi f_i t)$.

Claim 14 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base station~~ communication ~~transmitter~~ system of claim 12 wherein said one of the two oscillator switches connects to either the positive $\cos(2\pi f_i t)$ or the negative $\cos(2\pi f_i t)$ [[;]] and said another of the two oscillator switches connects to either the negative $\sin(2\pi f_i t)$ or the positive $\sin(2\pi f_i t)$ at the same time.

Claim 15 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB ~~base station~~ communication ~~transmitter~~ system of claim 12 wherein said QPSK switch ~~either~~ connects to either the ~~up-carrier multiplier~~ even-

sequence-based mixer or ~~connects to~~ the ~~down-carrier multiplier~~ odd-sequence-based mixer.

Claim 16 (currently amended): A multiuser ~~DSSS-OFDM~~ direct sequence spread spectrum (DSSS) orthogonal frequency division multiplexing (OFDM) multiband of ~~UWB~~ ultra wideband (UWB) mobile communication receiver comprising:

~~a combination section of a multiband multicarrier down converter and demodulation, an A/D unit, and a digital receiver filter unit;~~

~~a FFT and FEQ section;~~

~~a polyphase-based demultiband; and~~

~~a despreading, deinterleaver and decoding section.~~

a low noise amplifier (LNA) coupled to an automatic gain control (AGC);

the AGC coupled to a multiband multicarrier down converter and demodulation;

the multiband multicarrier down converter and demodulation coupled to N analog-to-digital (A/D) converters, where N is an integer and greater than 1;

the N A/D converters coupled to 2N digital receiver filters;

the 2N digital receiver filters coupled to N time-domain equalizers (TEQ);

the N TEQ coupled to N serial-to-parallel (S/P);

the N S/P coupled to N guard removing;

the N guard removing coupled to N fast Fourier transform (FFT);

the N FFT coupled to N frequency-domain equalizers (FEQ);

the N FEQ coupled to N parallel-to-serial (P/S) and the N A/D converters;

the N P/S coupled to a multiband combination;

the multiband combination coupled to a dispreading, deinterleaving and decoding unit;

a channel estimator coupled to the N FEQ and the N guard removing; and

a software and time control coupled to the AGC, the multiband multicarrier down converter and demodulation, the N A/D converters, and the channel estimator.

Claim 17 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim 16 wherein said ~~combination section of a multiband multicarrier down converter and demodulation, an A/D unit, and a digital receiver filter unit includes an analog bandpass filter, eleven multiband QPSK down converters and demodulations, twenty-two A/D converters, and twenty-two digital receiver filters.~~ multiband multicarrier down converter and demodulation further includes P multiband quadrature phase-shift keying (QPSK) down converters and demodulations, where P is an integer and greater than 1.

Claim 18 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim [[16]] 17 wherein said each of the [[N]] P multiband QPSK down converters and demodulations further include ~~an up-level carrier multiplier of~~ a mixer of a carrier $\cos(2\pi f_i t)$ coupled to an anti-aliasing analog filter and ~~a down-level carrier multiplier of~~ a mixer of a carrier $\sin(2\pi f_i t)$ coupled

to an anti-aliasing analog filter, where f_i is the carrier frequency for ith multiband and i is an integer.

Claim 19 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim [[16]] 18 wherein said ~~FFT and FEQ section includes eleven FFT units and eleven FEQ units.~~ ith multiband can be turn on or off, where i is an integer.

Claim 20 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim [[19]] 16 wherein said each of the N FFT ~~unit~~ has 1024 real-value inputs and produces 500 complex outputs ~~in the frequency-domain~~ and 12 Nulls, where N is an integer.

Claim 21 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim [[19]] 16 wherein said each of the N FEQ ~~unit~~ includes [[500]] M equalizers, [[500]] M decision detectors, [[500]] M subtracts, and an adaptive algorithm, where M is an integer.

Claim 22 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim 21 wherein said each of the M equalizers is a linear equalizer with N-tap adjustable coefficients, where M and N are integers.

Claim 23 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of

claim 21 wherein said each of the M decision detectors is a multi-level threshold.

Claim 24 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim 16 wherein said ~~polyphase-based~~ [[de]]multiband combination includes a modular counter, eleven random access memory (RAM) ~~memories~~ units, eleven up sample[[s]] units, ten sample delay[[s]] units, and a addition.

Claim 25 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim 24 wherein said ~~polyphase-based~~ [[de]]multiband combination converts eleven multiband input sequences with a length of [[N/11]] L into a serial output sequence with a length of N, where N is equal to 11L and L is an integer.

Claim 26 (currently amended): The multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication receiver of claim 16 wherein said despreading, ~~deinterleaver~~ deinterleaving and decoding ~~section~~ unit further includes a despreading multiplier, a user key, ~~sequence,~~ a deinterleaver, a ~~Viterbi~~ decoding, and a user bitstream.

Claim 27 (currently amended): A multiuser ~~DSSS-OFDM~~ multiband of ~~UWB~~ ultra wideband (UWB) communication system comprises a multiuser ~~DSSS-OFDM~~ direct sequence spread spectrum (DSSS) orthogonal frequency division multiplexing (OFDM) multiband of UWB base station communication transmitter and receiver, and N different users of [[the]]

~~DSSS-OFDM~~ DSSS OFDM multiband of UWB mobile communication transmitters and receivers[[;]], where N is an integer.

Claim 28 (currently amended): The multiuser ~~DSSS-OFDM~~ multiband of UWB communication system of claim 27 wherein said multiuser ~~DSSS-OFDM~~ DSSS OFDM multiband of UWB base station communication transmitter and receiver can transmit and receive N different user[[s]] UWB signals simultaneously, where N is an integer.